Bluetooth Wireless Speakers

BTS3000

Service
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Service Manual

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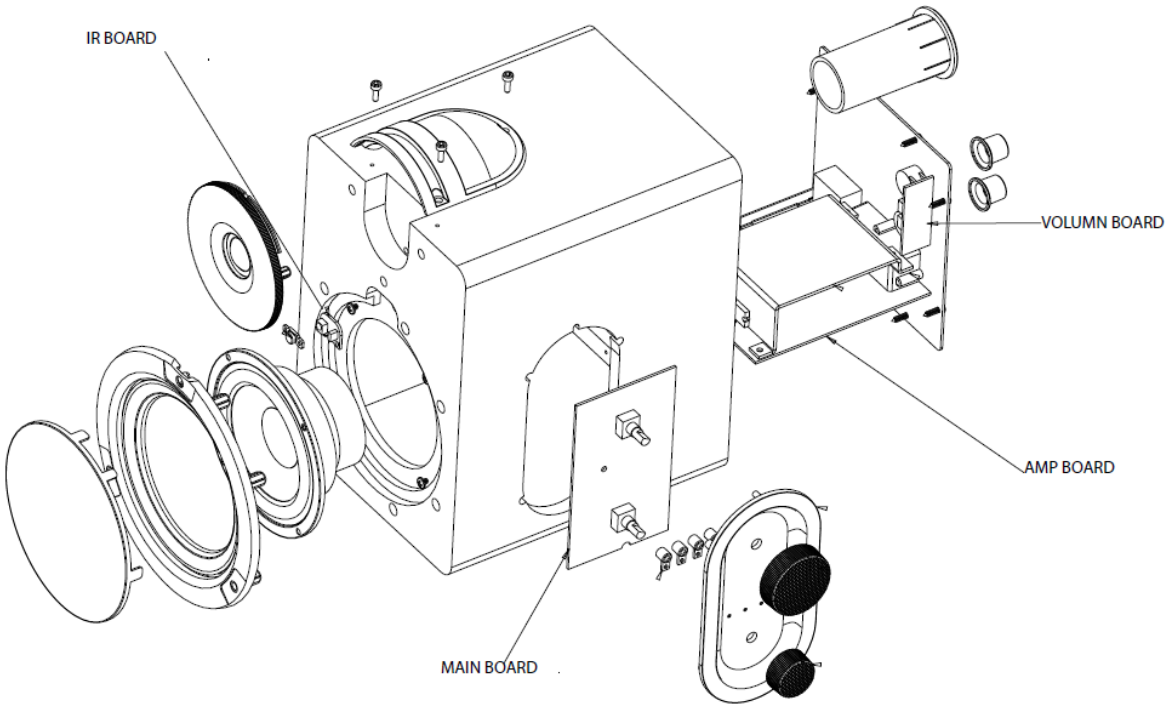
Published by FK1349 Subject to modification 3140 038 61180

Version 1.0

1-1 Location of PCB Boards



1-2 Versions Variation & PCBA Repair Policy

Type/Versions / Board in used	BTS3000G	
	/10	
Mainboard	MLR	
AMP board	MLR	
Vol. board	MLR	

Remark:
CLR = Component Level Repair
MLR = Module Level Repair

2 Specification

General

Model Name: BTS3000 connected audio speaker

Main features:

1. Audio source: AUX IN/Bluetooth/Coaxial/Optical
   Bluetooth with APT-X decoder, Coaxial, Optical support PCM format only
2. Audio output power: 2X10W at THD 10%
   Bass driver: 4 inch, Tweeter: 0.75 inch.
3. USB port provides 2A(max) charge current

Key parts:

1. Bluetooth module: BM845 ROM, CSR chipset
2. Coaxial/Optical IC: CS8422-CNZ QFN32
3. Audio power amp.: BT4860B
4. DAC IC: CS4354
5. MCU IC: SSI95F165AQPP

Lifetime : 3 years
Safety requirements IEC60950-1, EN60950-1. For details refer to approbation plan.
EMC requirements Active Radiation, Radiation Immunity, Conductive Interference (R&TTE ,FCC ID,IC ID) EN 300 328, EN 55022/EN 55024, EN 301 489-1/-17, EN 50385, IC RSS 210, IC RSS 102 For details refer to approbation plan.
Climatic requirements(indoor product/ all climates , not water/rain resistant) Operating Temperature: 0°C to +40°C, Humidity: 8% to 90%. Storage Temperature: -25°C to +60°C, Humidity: 5% to 90%
Power supply AC 100V—240V , 36W
Weight: 4.1 Kg ±5% (with accessories)

Audio Specification

1. Coaxial and Optical

Test Conditions

a) Speaker output load: 2* 6Ω, b) Input PCM audio signal from coaxial/ optical sources. Standard: IEC60958-3, TOSLINK

Item	Condition	Norm.	Limit	Unit	Remark	SN
Output Power At 10% THD	Load 6Ω L/R	10W	+/-10%	W	20Hz-20kHz LPF	1
Operating Temperature		0-40		℃		2
SNR (A-weighted)	Input 1kHz	70	65	dB		3
	Input 100—16KHz	70	65			
Frequency response		100-20KHZ		Hz	+/-3dB frequency	4
Left-Right Channel Separation	Left-Right	45		dB		5
	Right-Left	45				
Left-Right Channel Balance	Input 1kHz	1		dB		6
	Input 100—16KHz	1		dB		
Hum noise						7
	Left/Right (W/A)	<3.0		mV	20Hz-20kHz LPF	

2. AUX IN

Test Conditions

b) Speaker output load: 2* 6Ω

Item	Condition	Norm.	Limit	Unit	Remark	SN
Output Power At 10% THD	Load 6Ω L/R	10W	+/-10%	W	20Hz-20kHz LPF	1
Operating Temperature		0-40		℃		2
SNR (A-weighted)	Input 1kHz	70	65	dB		3
	Input 100—16KHz	70	65			
Frequency response		100-20KHZ		Hz	+/-3dB frequency	4
Left-Right Channel Separation	Left-Right	45		dB		5
	Right-Left	45				
Left-Right Channel Balance	Input 1kHz	1		dB		6
	Input 100—16KHz	1		dB		
Hum noise						7
	Left/Right (W/A)	<3.0		mV	20Hz-20kHz LPF	
Sensitivity	Left at 10%THD	1000		mVrms		8
	Right at 10%THD	1000		mVrms		

3. Bluetooth streaming

Test Conditions

c) Speaker output load: 2* 6Ω, b) Streaming audio signal from iPhone 4/iPad2

Item	Condition	Norm.	Limit	Unit	Remark	SN
Output Power At 10% THD	Load 6Ω L/R	10W	+/-10%	W	20Hz-20kHz LPF	1
Operating Temperature		0-40		℃		2
SNR (A-weighted)	Input 1kHz	70	65	dB		3
	Input 100—16KHz	70	65			
Frequency response		100-16KHZ		Hz	+/-3dB frequency	4
Left-Right Channel Separation	Left-Right	45		dB		5
	Right-Left	45				
Left-Right Channel Balance	Input 1kHz	1		dB		6
	Input 100—16KHz	1		dB		
Hum noise						7
	Left/Right (W/A)	<3.0		mV	20Hz-20kHz LPF	

Bluetooth Distance

Description	Specification	Test Condition
Reception Distance(free field)	>10m	Streaming music smoothly
Frequency range	2.4GHz—2.5GHz	

Remote Control (RC6, 36KHz)

Description	Specification	Test Condition
	>10m	0 deg.
Operating distance	>7.92	30 deg. (hor. & vert.)
	>5,65	45 deg. (horizontal)

LED indicator

Source	Color
Power/BT	white
Optical	white
Coaxial	white
Aux-in/RCA	white

Power Supply (fulfil ERP2 requirement)

Description	Specification	Test Condition
Input Voltage	AC 100v to 240v	
Over current protection	Yes(3.5A)	
Output short circuit protection	Yes	
Efficiency level	Level v	
Operating Temperature	0~40□	
Output Voltage	DC 12V	
Output Current	3A	
Line Length	1.5m	
Connector	IEC	

USB Charge Port (Type A)

Description	Specification	Test Condition
OUTPUT DC 5V	≤2A	no music playing
OUTPUT DC 5V	≤1A	With music playing

ESD

Test Method: EN61000-4-2

- Ambient temperature : 15 – 35 ˚C
- Humidity: 30 – 50%
- Pre-condition for the set before test : put the set into the ESD room at least 4 hours
- Supply: AC
- Set condition: Audio mode

Test requirement:

- Contact discharge : from 0 kV to ± 8 kV
- Air discharge : from 0 kV to ± 15 kV

Severity level	1	2	3	4	5	S/N
Contact discharge (+/- kV)	0-2	2-4	4-5	5-7	N.A.	
Air discharge (+/- kV)	0-4	4-8	8-10	10-15	N.A.	
Small pop noise	X	P	P	P	P	
Large pop noise	X	X	P	P	P	
Short mute (<1 second)	X	P	P	P	P	
Long mute (>1 second)	X	X	P	P	P	
Short wrong display (<1 second)	X	P	P	P	P	
Long wrong display (>1 second)	X	X	P	P	P	
Change of function – recover by normal intervention	X	X	P	P	P	
Loss of volatile memory	X	X	P	P	P	
Reset	X	X	P	P	P	
Shut down – recover by on-off button	X	X	P	P	P	
Hang up – recover by play/on-off/reset button	X	X	P	P	P	
Hang up – recover by re-connect power	X	X	P	P	P	
Go to record mode	X	X	P	P	P	
Go from standby to on mode	X	X	P	P	P	
Loss of fixed stored data	X	X	X	X	X	
Component damaged	X	X	X	X	X	

Note: X = not allowed, P = allowed.

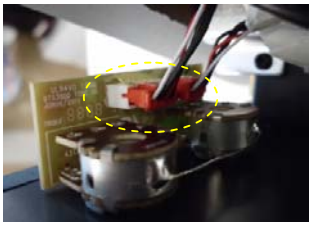
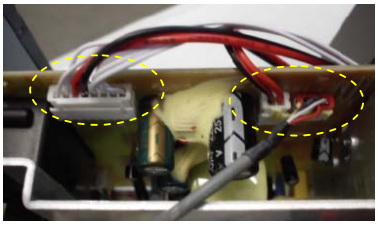
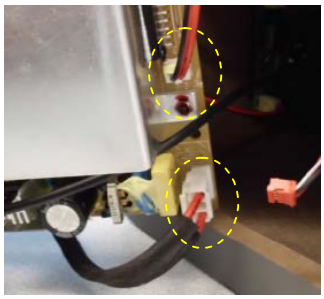
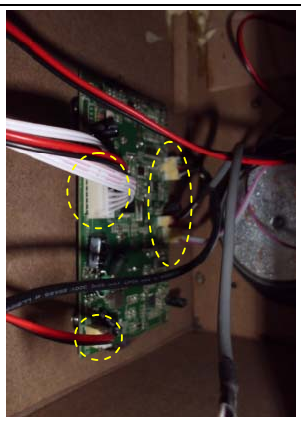
Mechanical Specification

Item	Limit	Remarks
Drop Test:		
	Limit	Remarks
Bare Drop (w/o packing)	NA	Criteria: set has no functional damage & major cosmetic defect after test.
Normal Drop with full package	70cm Face drop / 35cm Edge&Corner drops	Criteria: set has no functional damage & major cosmetic defect after test.
Cold Drop with full package	70cm Face drop / 35cm Edge&Corner drops	Criteria: set has no functional damage & major cosmetic defect after test.
Mechanical miscellaneous		
No sharp point on the unit accessible by end user is allowed.		
Rattle is not allowed on the desktop usage.		

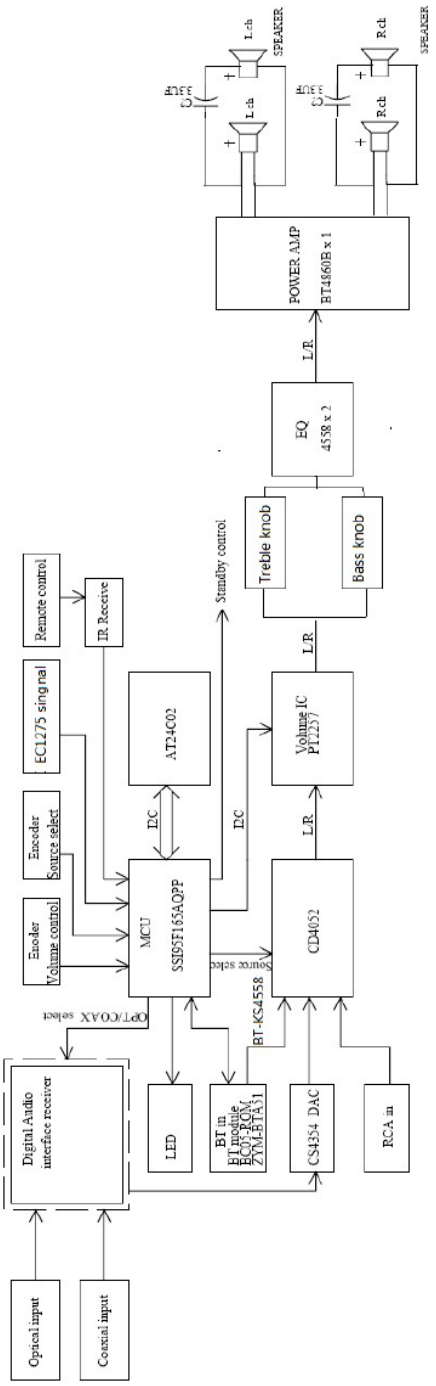
Cosmetic Specification

Part	Limit	Remarks
scratch Defects of dirt-mark, dust particle, hole, rough part, should be	less than 0.3mm	
Gap	≤0.3mm	

3 Disassembly Instruction

	Open the speaker 1) Unscrew 13 screws at the back side of speaker Note: 2 screws on power cord socket does not need
  	**Rmove the AMP board module from speaker** 1) Unplug two connectors from sockets on volume board 2) Unplug these connectors from sockets at top view side 3) Unplug these connects from sockets on right hand side
  	**Remove the Main board from speaker** 1) Unscrew the vol. and source button 2) Disconnect these sockets as circled on picutre

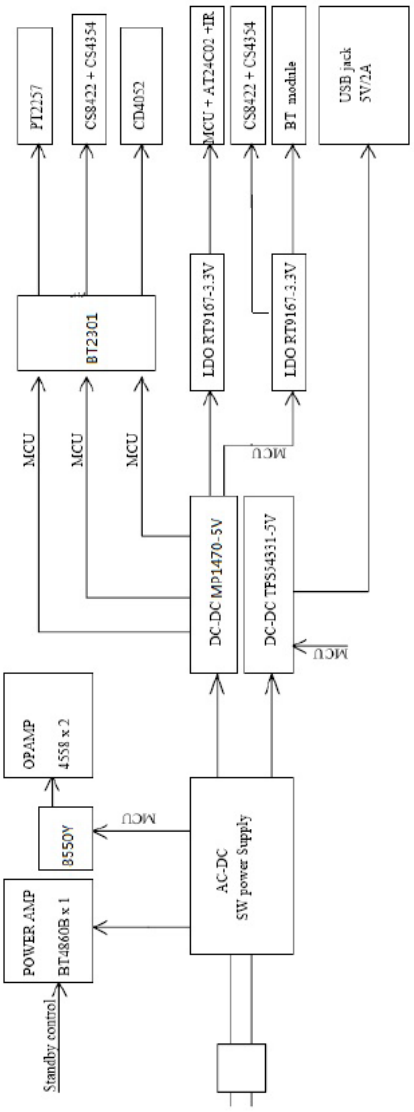
4 Block Diagram



Aux-in : Adjust volume min/max according to CD4052&PT2257, then will insert EQ(4558) to adjust Treble and bass, finally insert amplifier output to driver;

BT : when under BT mode, MCU control BT module to auto sourcing around BT device, will enter behind amplier output to driver when connected the signal input;

Coax & OPT : When under Coax&OPT mode, MCU control decoding chip from output signal to behind amplifier, then output to driver

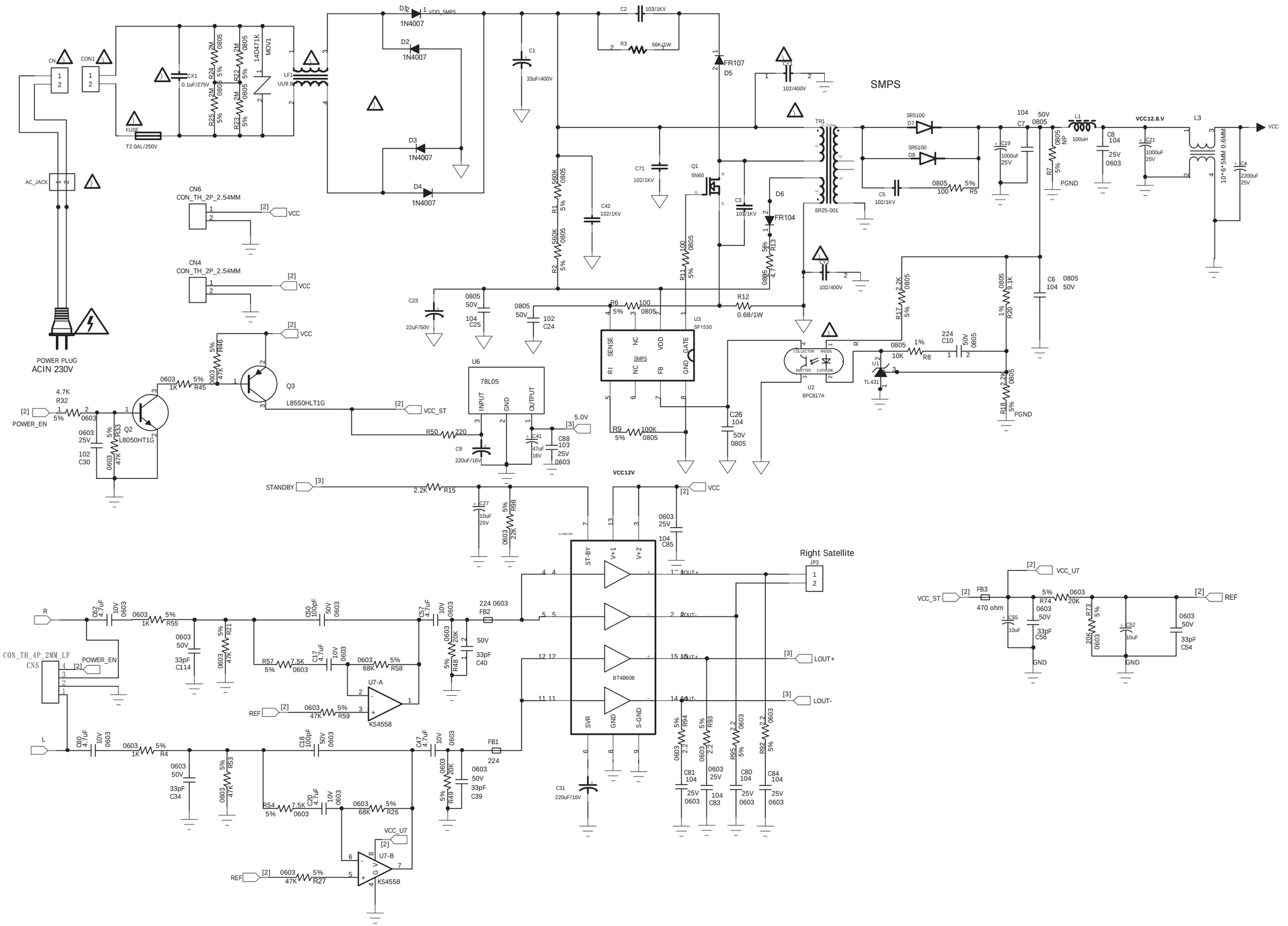


Power control:

it will output DC power 18V via SMPS, then DC-DC output 5V to USB supply, finally output 3.3V to power supply for MCU, BT, OPTICAL, COXIAL via LDO.

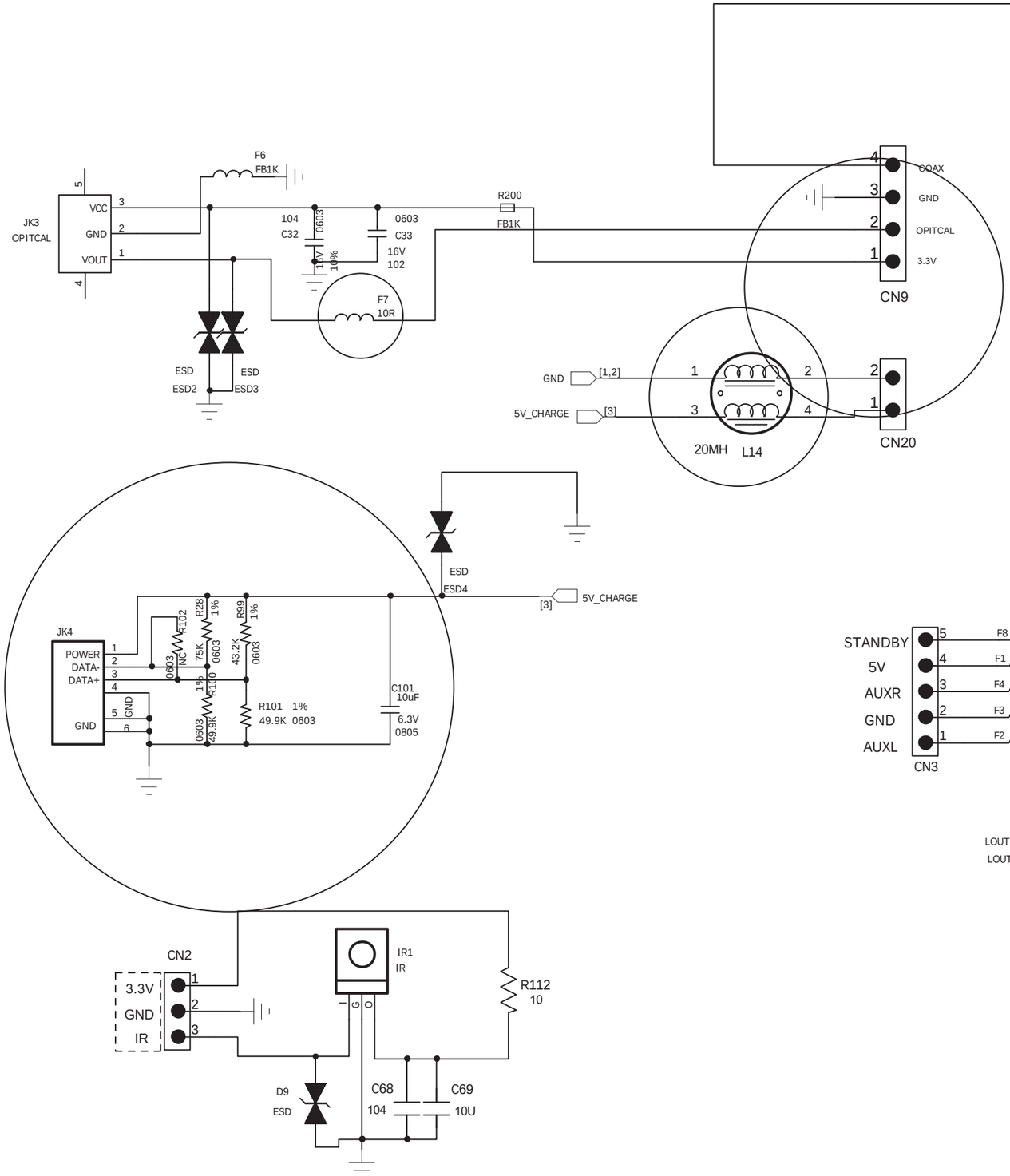
5 - 1

CIRCUIT DIAGRAM - AMP BOARD
PART 1



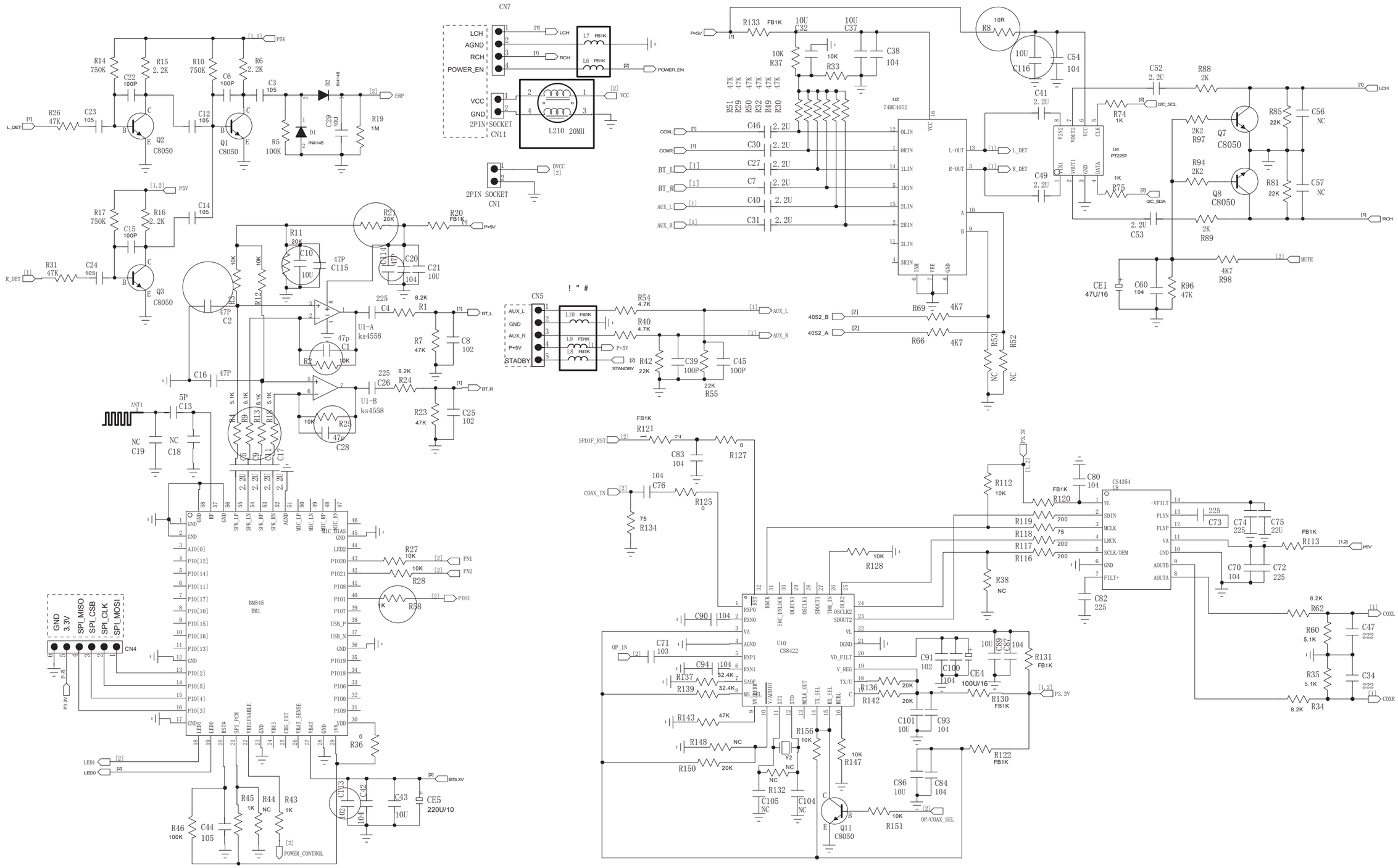
5 - 2

CIRCUIT DIAGRAM - AMP BOARD
PART 2



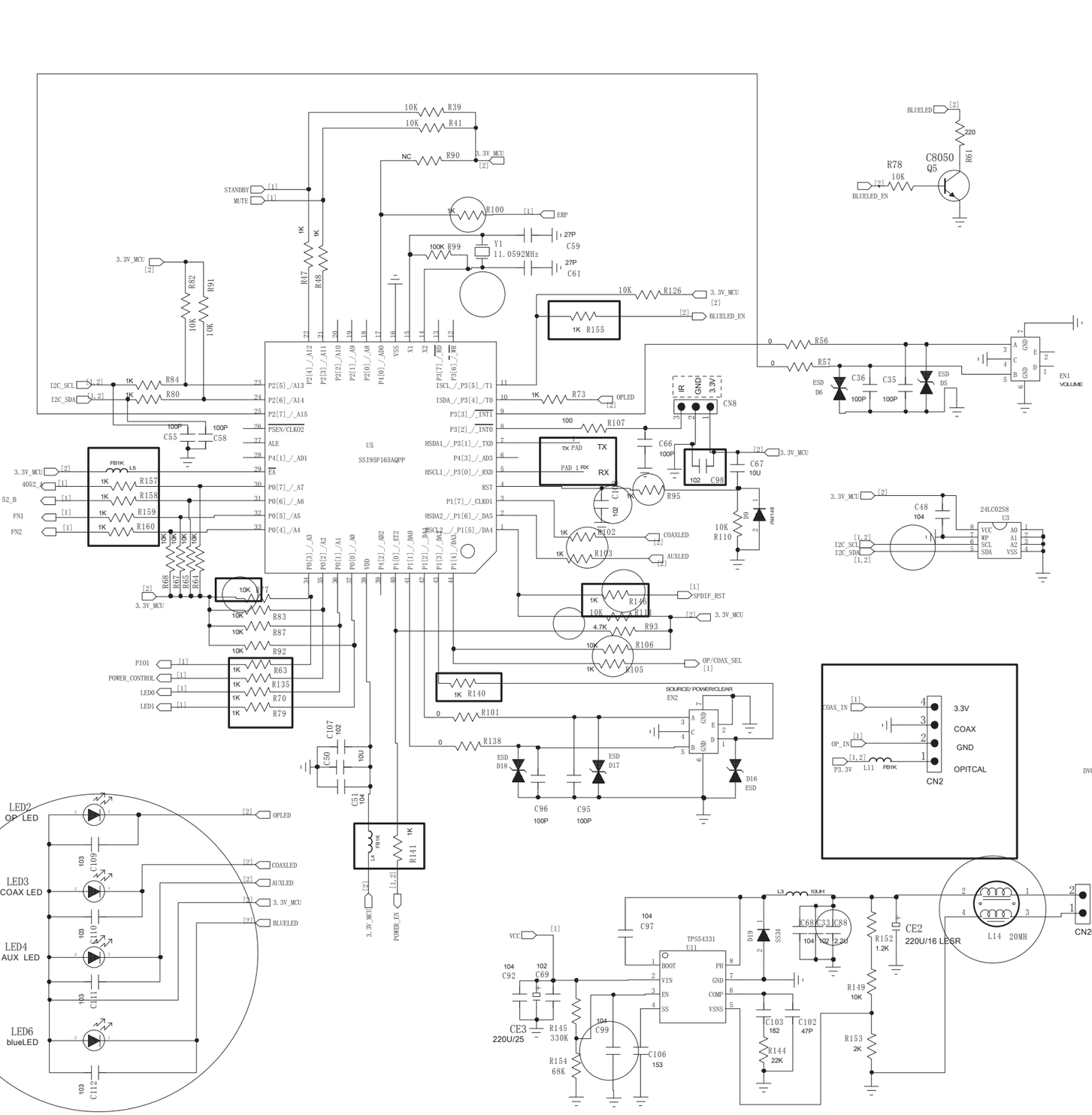
5 - 3

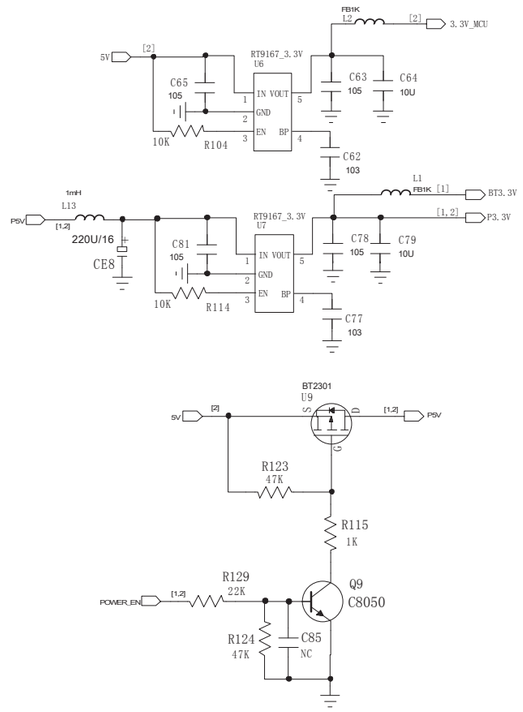
CIRCUIT DIAGRAM - MAIN BOARD
audio PART

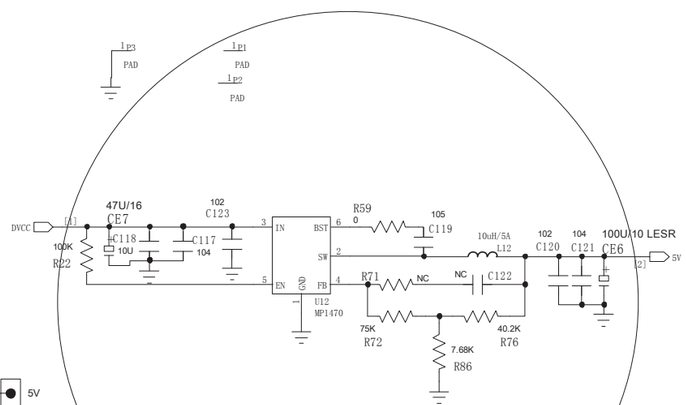


5 - 4

CIRCUIT DIAGRAM - MAIN BOARD
MCU PART

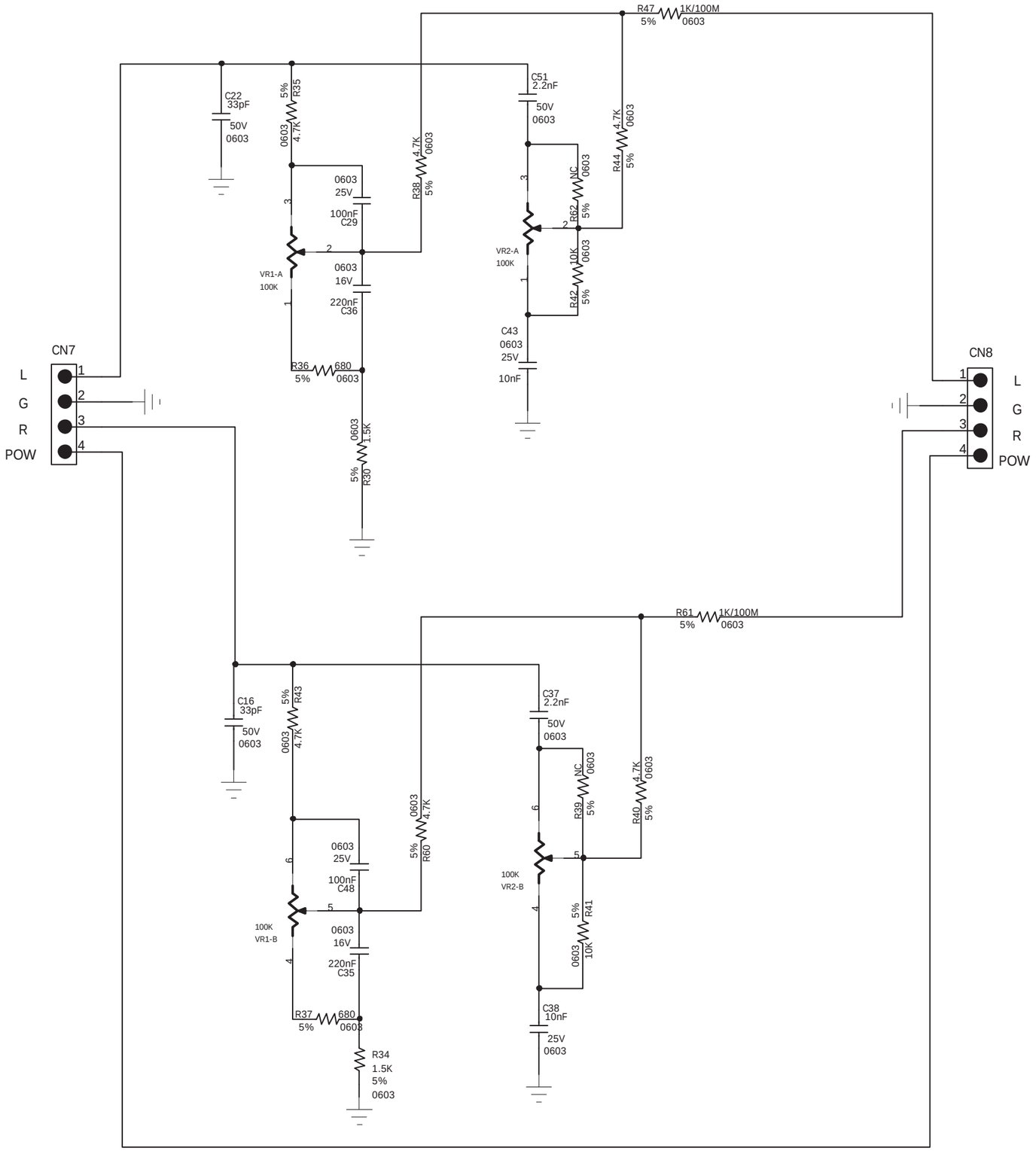






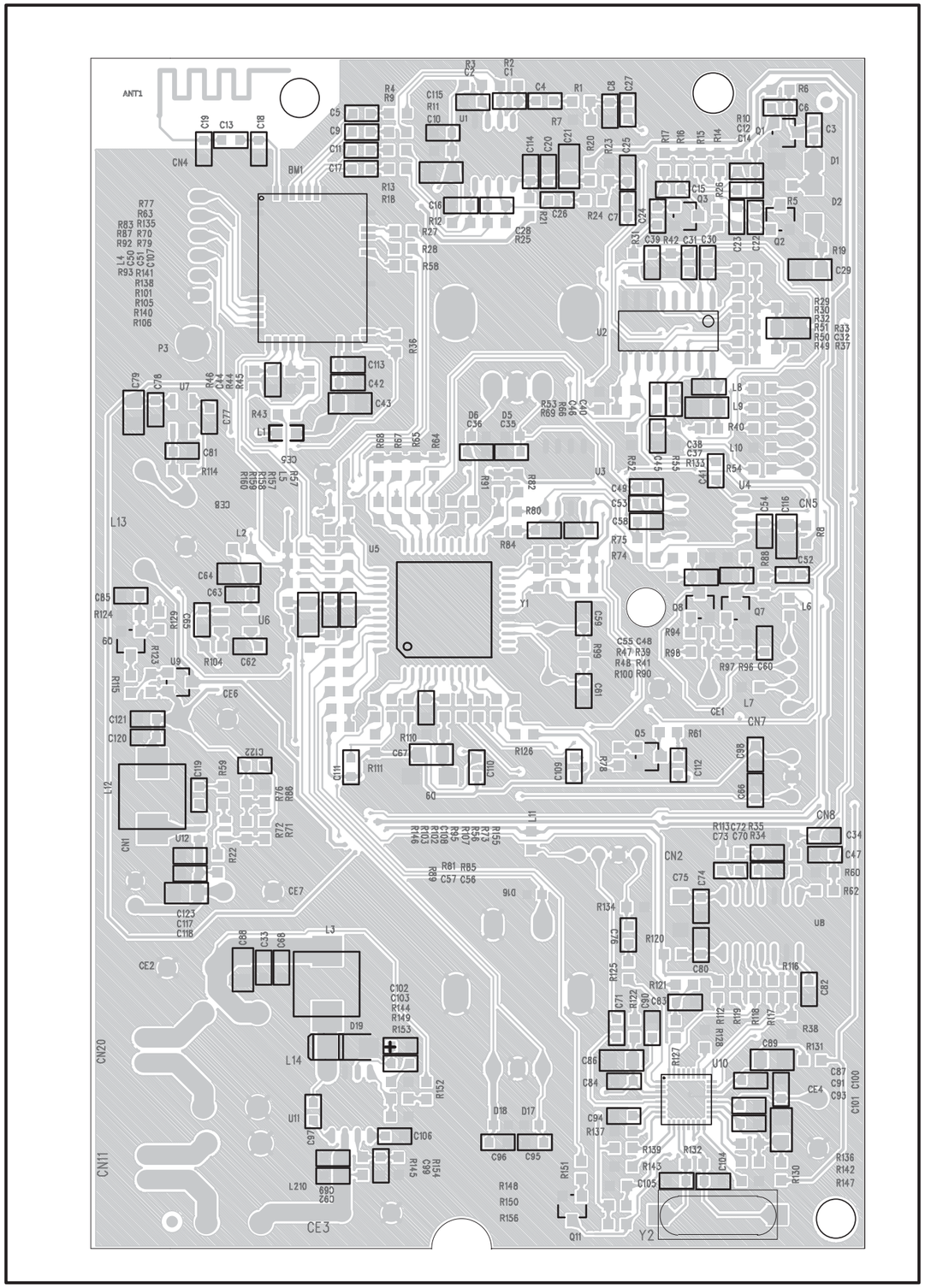
5 - 5

CIRCUIT DIAGRAM - VOLUME BOARD



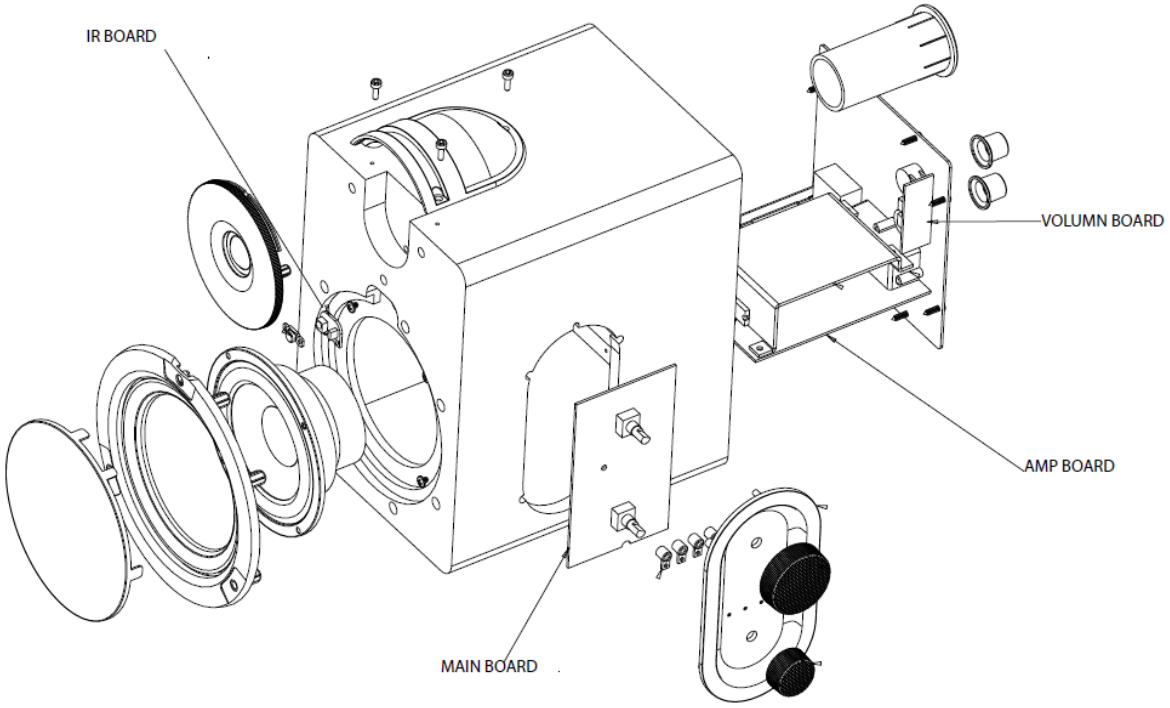
5 - 6

CIRCUIT DIAGRAM - MAIN BOARD

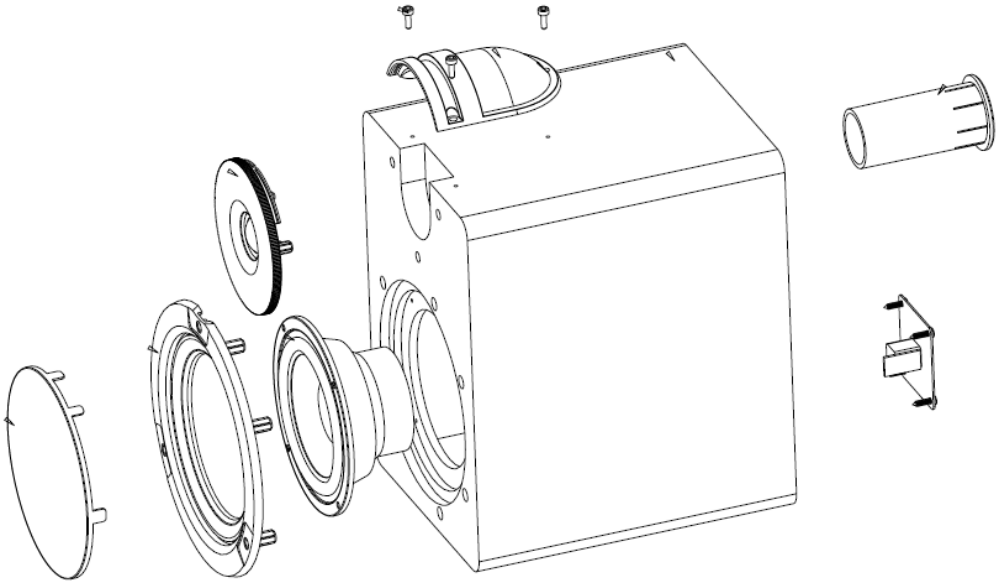


6 Mechanical Exploded View

Right Speaker



Left Speaker



7 Revision List

2013-11-28 V1.0 Initial release